Comfort-Aire® Century®

INSTALLATION MANUAL

UltraV Series Outdoor Units

Models

A-VMH18DU-1
A-VMH28TU-1
A-VMH36QU-1
A-VMH48PU-1

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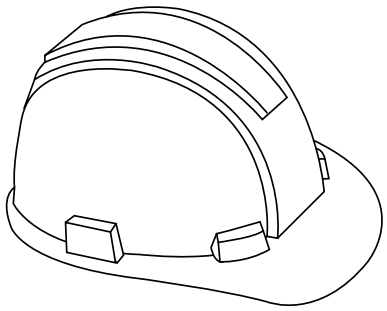
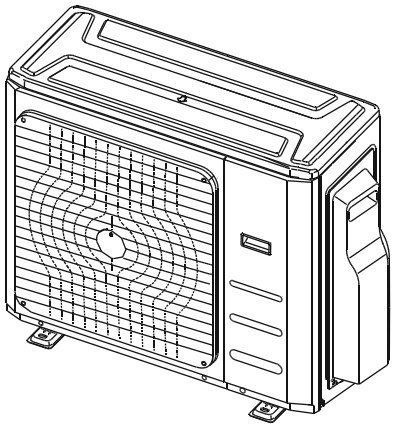
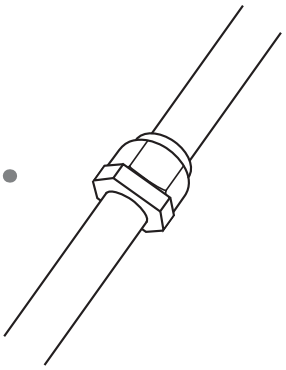
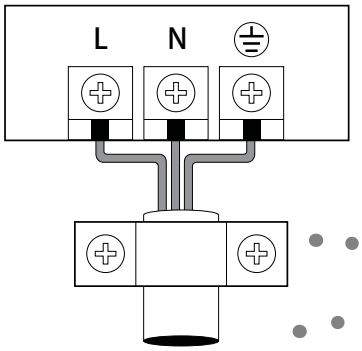
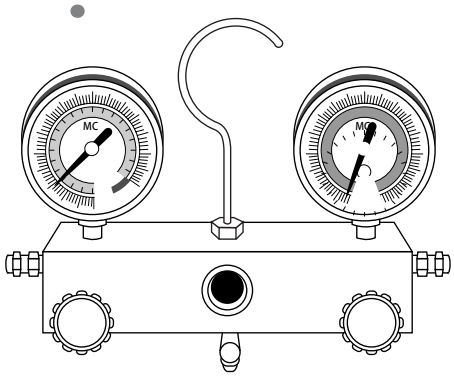
Installation Manual











Attention

ALL INVERTER MINI-SPLITS REQUIRE 14-4 STRANDED WIRE BETWEEN THE INDOOR AND OUTDOOR UNITS

(NO EXCEPTIONS)

14 AWG 4/C TRAY CABLE

A14/4SRBTHHNBK

14 AWG (19/0147) BC 4/C, THHN CONDUCTORS POWER & CONTROL

TRAY CABLE TYPE TC CABLE FOR INSTALLATION IN ACCORDANCE WITH ARTICLE 336 AND OTHER APPLICABLE PARTS OF THE NATIONAL ELECTRIC CODE. 600V (UL) E123517 DIRECT BURIAL SUNLIGHT RESISTANT PVC JACKET

10/25/16

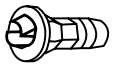
RoHS Compliant

MADE IN USA BLACK

Accessories

1

The air conditioning system comes with the following accessories. Use all of the installation parts and accessories to install the air conditioner. Improper installation may result in water leakage, electrical shock and fire, or equipment failure.

Name			Shape	Quantity
Installation plate				1
Plastic expansion sheath				5-8 (depending on models)
Self-Tapping Screw A ST3.9X25				5-8 (depending on models)
Drain joint (some models)				1
Seal ring (some models)				1
Connecting pipe assembly	Liquid side	Ø6.35		Parts you must purchase. Consult a technician for the proper size.
		Ø9.52		
	Gas side	Ø9.52		
		Ø12.7		
		Ø15.9		
Owner's manual				1
Installation manual				1
Transfer connector (packed with the indoor or outdoor unit, depending on models) NOTE: Pipe size may differ from appliance to appliance. To meet different pipe size requirements, sometimes the pipe connections need a transfer connector installed on the outdoor unit .				Optional part (one piece/one indoor unit)
				Optional part (1-5 pieces for outdoor unit, depending on models)
Magnetic ring (Hitch on the communication cable between the indoor unit and outdoor unit after installation.)				Optional part (one piece/one cable)
Cord protection rubber ring (If the cord clamp cannot fasten on a small cord, use the cord protection rubber ring [supplied with accessories] to wrap around the cord. Then fix it in place with the cord clamp.)				1 (on some models)

Optional Accessories

There are two types of remote controls: wired and wireless.
Select a remote controller based on customer preferences and requirements and install in an appropriate place.
Refer to catalogues and technical literature for guidance on selecting a suitable remote controller.

Safety Precautions

2

Read Safety Precautions Before Installation

Incorrect installation due to ignoring instructions can cause serious damage or injury.
The seriousness of potential damage or injuries is classified as either a WARNING or CAUTION.

WARNING

Failure to observe a warning may result in death. The appliance must be installed in accordance with national regulations.

CAUTION

Failure to observe a caution may result in injury or equipment damage.

WARNING

- Carefully read the Safety Precautions before installation.
- In certain functional environments, such as kitchens, server rooms, etc., the use of specially designed air-conditioning units is highly recommended.
- Only trained and certified technicians should install, repair and service this air conditioning unit.
  Improper installation may result in electrical shock, short circuit, leaks, fire or other damage to the equipment and personal property.
- Strictly follow the installation instructions set forth in this manual.
  Improper installation may result in electrical shock, short circuit, leaks, fire or other damage to the equipment.
- Before you install the unit, consider strong winds, typhoons and earthquakes that might affect your unit and locate it accordingly. Failure to do so could cause the equipment to fail.
- After installation, ensure there are no refrigerant leaks and that the unit is operating properly. Refrigerant is both toxic and flammable and poses a serious health and safety risk.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

⚠ WARNING

- The appliance disconnection must be incorporated with an all-pole disconnection device using hard wiring in accordance with electrical codes.
- Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment specification.
- Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of refrigerants.
- The appliance shall be stored so as to prevent mechanical damage from occurring.
- Keep ventilation openings clear of obstruction.

NOTE: The following informations are required for the units adopt R32/R290 Refrigerant.

- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Do not pierce or burn.
- Be aware that the refrigerants may not contain an odour.
- Compliance with national gas regulations shall be observed.
- Appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
- Appliance shall be installed, operated and stored in a room with a floor area larger than X m^2 (Please see the following form). The appliance shall not be installed in an unventilated space, if that space is smaller than X m^2 (Please see the following form).

Model (Btu/h)	Amount of refrigerant to be charged (kg)	maximum installation height (m)	Minimum room area (m^2)
≤30000	≤2.048	2.2m	4
≤30000	≤2.048	1.8m	4
≤30000	≤2.048	0.6m	35
30000-48000	2.048-3.0	2.2m	4
30000-48000	2.048-3.0	1.8m	8
30000-48000	2.048-3.0	0.6m	80
>48000	>3.0	2.2m	5
>48000	>3.0	1.8m	9
>48000	>3.0	0.6m	80

Note about Fluorinated Gasses

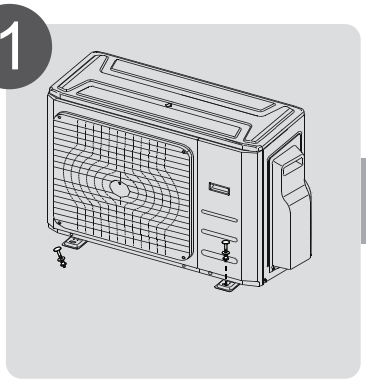
1. This air-conditioning unit contains fluorinated gasses. For specific information on the type of gas and the amount, please refer to the relevant label on the unit itself.
2. Installation, service, maintenance and repair of this unit must be performed by a certified technician.
3. Product uninstallation and recycling must be performed by a certified technician.
4. If the system has a leak-detection system installed, it must be checked for leaks at least every 12 months.
5. When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.

Installation Overview

3

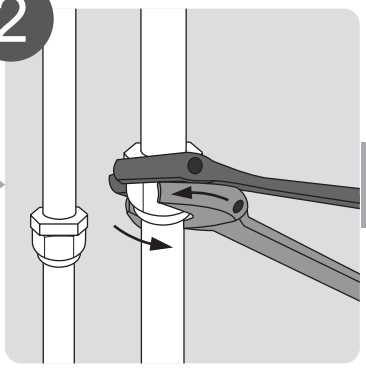
INSTALLATION ORDER

1



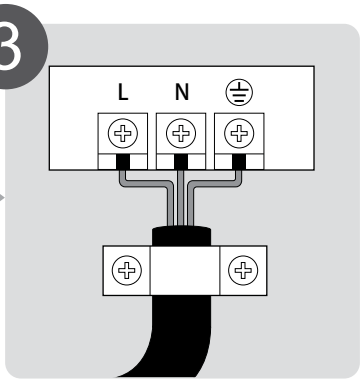
Install the outdoor unit
(Page 11)

2



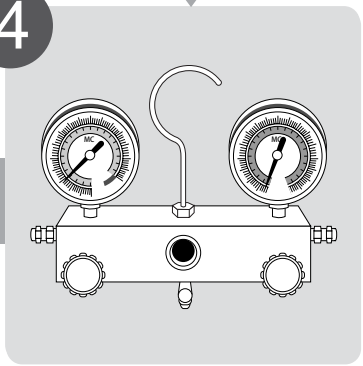
Connect the refrigerant pipes
(Page 14)

3



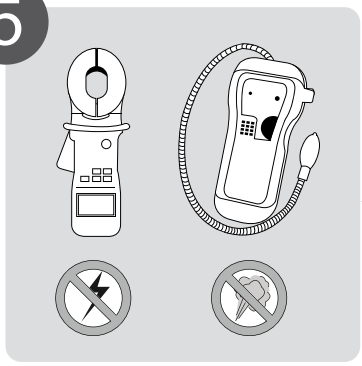
Connect the wires
(Page 17)

4



Evacuate the refrigeration system
(Page 23)

5

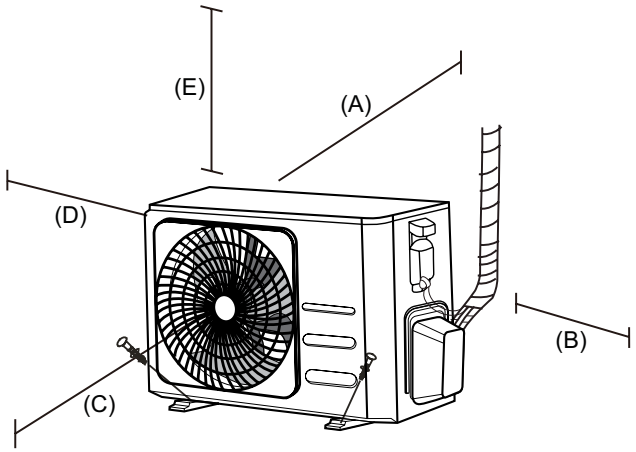


Perform a test run
(Page 26)

Installation Diagram

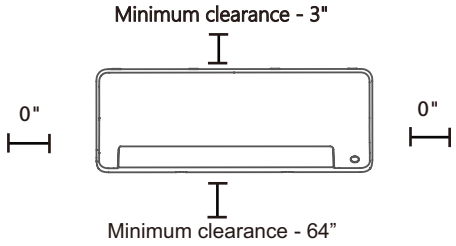
4

Installation Diagram



A	4” Clearance (Min. allowed) 1%-2% efficiency and capacity Loss 5” Clearance with no efficiency or capacity loss
B	12” on right
C	79” in front
D	12” on left
E	24” above

Refer to the following diagram to ensure proper distance from walls and ceiling:



NOTE:

- The installation must be performed in accordance with local and national standards. Standards may vary in different areas.
- A minimum pipe run of 3 meters is required to minimize vibration & excessive noise.
- Two of the B, C, and D air circulation pathways must be free from obstructions at all times.

Specifications

5

Table 5.1

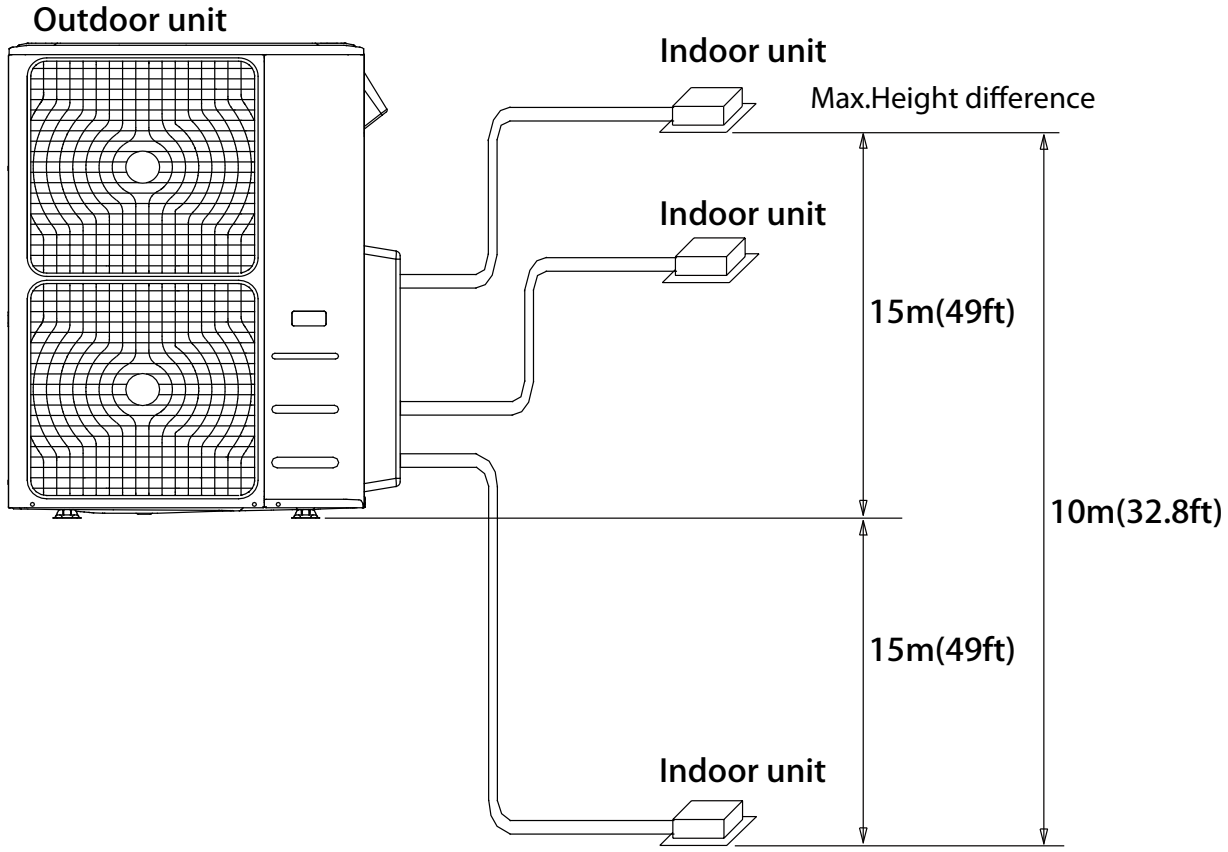
Number of units that can be used together	Connected units	1-4 units
Compressor stop/start frequency	Stop time	3 min or more
Power source voltage	voltage fluctuation	within ±10% of rated voltage
	voltage drop during start	within ±15% of rated voltage
	interval unbalance	within ±3% of rated voltage

Table 5.2

Unit: m/ft.

	1 drive 2	1 drive 3	1 drive 4
Max. length for all rooms	40/131	60/197	80/262
Max. length for one indoor unit	25/82	30/98	35/115
Max. height different between indoor and outdoor unit	15/49	15/49	15/49
Max. height different between indoor units	10/33	10/33	10/33

When installing multiple indoor units with a single outdoor unit, ensure that the length of the refrigerant pipe and the drop height between the indoor and outdoor units meet the requirements illustrated in the following diagram:



Outdoor Unit Installation

6

Outdoor Unit Installation Instructions

Step 1: Select installation location.

The outdoor unit should be installed in a location that meets the following requirements:

- ☑ Place the outdoor unit as close to the indoor unit as possible.
- ☑ Ensure that there is enough room for installation and maintenance.
- ☑ The air inlet and outlet must not be obstructed or exposed to strong wind.
- ☑ Ensure the location of the unit will not be subject to snowdrifts, accumulation of leaves or other seasonal debris. If possible, provide an awning for the unit. Ensure the awning does not obstruct airflow.
- ☑ The installation area must be dry and well ventilated.
- ☑ There must be enough room to install the connecting pipes and cables and to access them for maintenance.

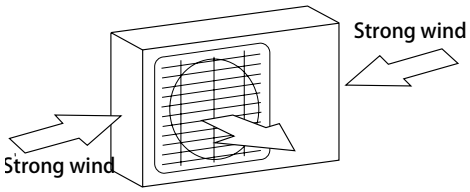


Fig. 6.1

Step 2: Install outdoor unit.

Fix the outdoor unit with anchor bolts (M10)

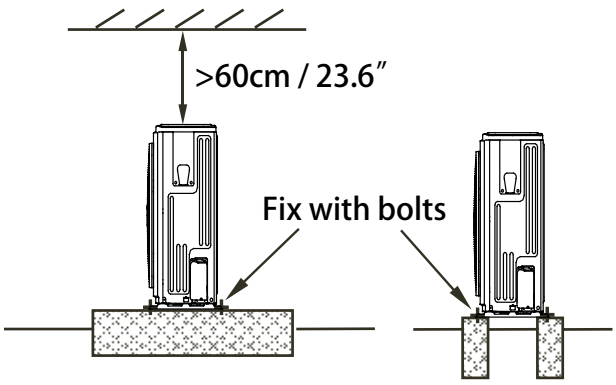


Fig. 6.3

- ☑ The area must be free of combustible gases and chemicals.
- ☑ The pipe length between the outdoor and indoor unit may not exceed the maximum allowable pipe length.
- ☑ If possible, DO NOT install the unit where it is exposed to direct sunlight.
- ☑ If possible, make sure the unit is located far away from your neighbors' property so that the noise from the unit will not disturb them.
- ☑ If the location is exposed to strong winds (for example: near a seaside), the unit must be placed against the wall to shelter it from the wind. If necessary, use an awning. (See Fig. 6.1 & 6.2)
- ☑ Install the indoor and outdoor units, cables and wires at least 3.2 ft from televisions or radios to prevent static or image distortion. Depending on the radio waves, a 3.2 ft distance may not be enough to eliminate all interference.

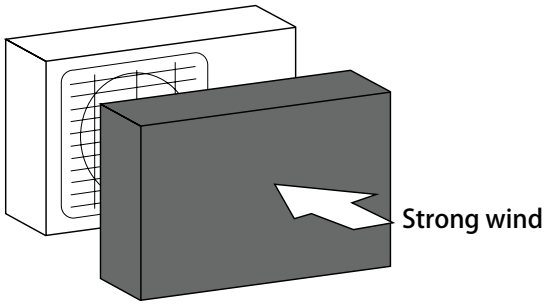


Fig. 6.2

CAUTION

- Be sure to remove any obstacles that may block air circulation.
- Make sure you refer to Length Specifications to ensure there is enough room for installation and maintenance.

Split Type Outdoor Unit

(Refer to Fig 6.4, 6.5, 6.6, 6.10 and Table 6.1)

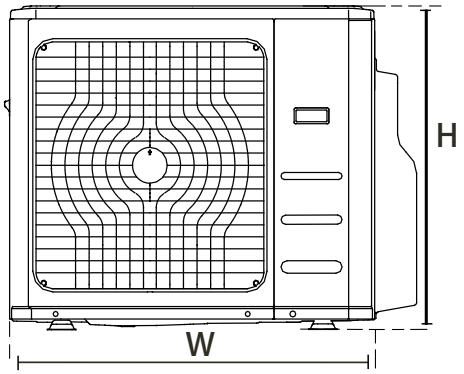


Fig. 6.4

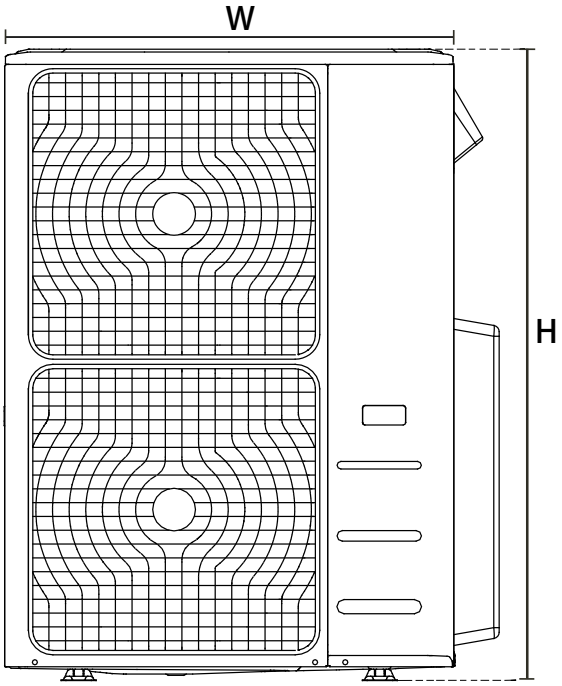


Fig. 6.5

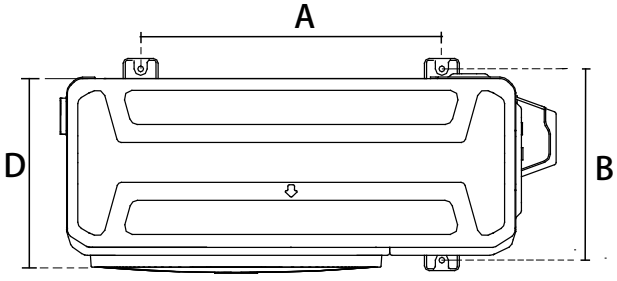


Fig. 6.6

Table 6.1: Length Specifications of Split Type Outdoor Unit (unit: mm/inch)

Outdoor Unit Dimensions W x H x D	Mounting Dimensions	
	Distance A	Distance B
760x590x285 (29.9x23.2x11.2)	530 (20.85)	290 (11.4)
810x558x310 (31.9x22x12.2)	549 (21.6)	325 (12.8)
845x700x320 (33.27x27.5x12.6)	560 (22)	335 (13.2)
900x860x315 (35.4x33.85x12.4)	590 (23.2)	333 (13.1)
945x810x395 (37.2x31.9x15.55)	640 (25.2)	405 (15.95)
990x965x345 (38.98x38x13.58)	624 (24.58)	366 (14.4)
938x1369x392 (36.93x53.9x15.43)	634 (24.96)	404 (15.9)
900x1170x350 (35.4x46x13.8)	590 (23.2)	378 (14.88)
800x554x333 (31.5x21.8x13.1)	514 (20.24)	340 (13.39)
845x702x363 (33.27x27.6x14.3)	540 (21.26)	350 (13.8)
946x810x420 (37.2x31.9x16.53)	673 (26.5)	403 (15.87)
946x810x410 (37.2x31.9x16.14)	673 (26.5)	403 (15.87)
952x1333x410 (37.5x52.5x16.14)	634 (24.96)	404 (15.9)
952x1333x415 (37.5x52.5x16.14)	634 (24.96)	404 (15.9)

Rows of series installation

Table 6.2 The relations between H, A and L are as follows.

	L	A
L ≤ H	L ≤ 1/2H	25 cm / 9.8″ or more
	1/2H < L ≤ H	30 cm / 11.8″ or more
L > H	Can not be installed	

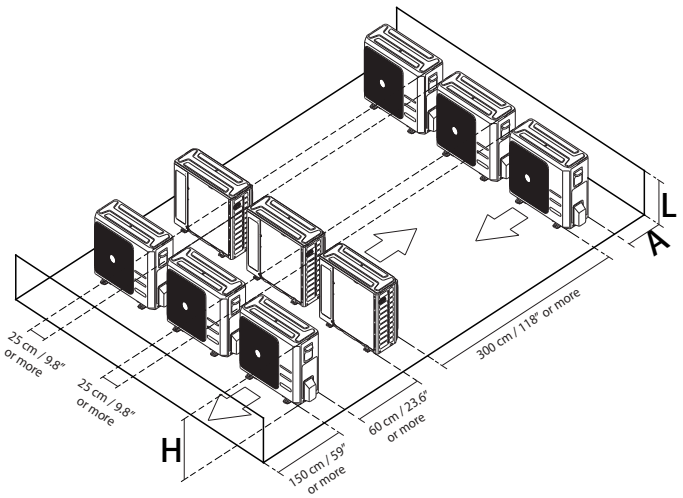
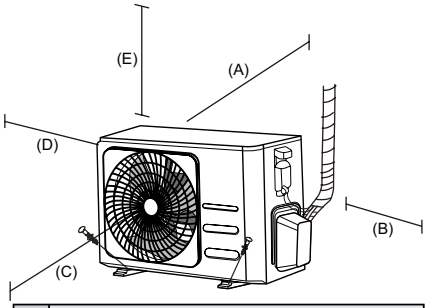


Fig. 6.7

NOTE: The minimum distance between the outdoor unit and walls described in the installation guide does not apply to airtight rooms. Be sure to keep the unit unobstructed in at least two of the three directions (B,C,D) (See Fig. 6.8)



A	4" Clearance (Min. allowed) 1%-2% efficiency and capacity Loss 5" Clearance with no efficiency or capacity loss
B	12" on right
C	79" in front
D	12" on left
E	24" above

Fig. 6.8

Drain Joint Installation

If the drain joint comes with a rubber seal (see Fig. 6.9 - A), do the following:

1. Fit the rubber seal on the end of the drain joint that will connect to the outdoor unit.
2. Insert the drain joint into the hole in the base pan of the unit.
3. Rotate the drain joint 90° until it clicks in place facing the front of the unit.
4. Connect a drain hose extension (not included) to the drain joint to redirect water from the unit during heating mode.

If the drain joint doesn't come with a rubber seal (see Fig. 6.9 - B), do the following:

1. Insert the drain joint into the hole in the base pan of the unit. The drain joint will click in place.
2. Connect a drain hose extension (not included) to the drain joint to redirect water from the unit during heating mode.

NOTE: Make sure the water drains to a safe location where it will not cause water damage or a slipping hazard.

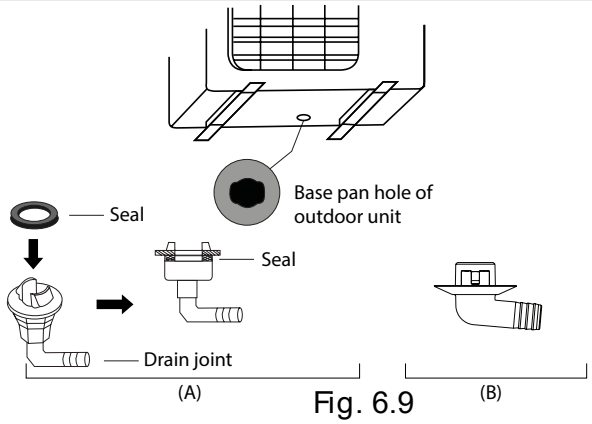


Fig. 6.9

Notes On Drilling Hole In Wall

You must drill a hole in the wall for the refrigerant piping, and the signal cable that will connect the indoor and outdoor units.

1. Determine the location of the wall hole based on the location of the outdoor unit.
2. Using a 65-mm (2.5") core drill, drill a hole in the wall.

   NOTE: When drilling the wall hole, make sure to avoid wires, plumbing, and other sensitive components.

3. Place the protective wall cuff in the hole. This protects the edges of the hole and helps seal it when you finish the installation process.

When Select a 24K Indoor Unit

The 24K indoor unit can only be connected with an A system. If there are two 24K indoor units, they can be connected with A and B systems. (See Fig. 6.10)

Table 6.3: Connective pipe size of an A and B system (unit: inch)

Indoor Unit capacity (Btu/h)	Liquid	Gas
9K/12K	1/4	3/8
12K/18K	1/4	1/2
24K	3/8	5/8

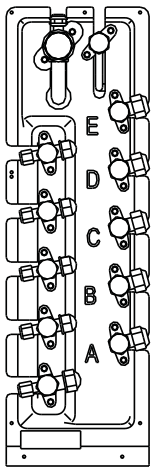


Fig. 6.10

Refrigerant Piping Connection 7

Safety Precautions

⚠ WARNING

- All field piping must be completed by a licensed technician and must comply with the local and national regulations.
- When the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration in the room from exceeding the safety limit in the event of refrigerant leakage. If the refrigerant leaks and its concentration exceeds its proper limit, hazards due to lack of oxygen may result.
- When installing the refrigeration system, ensure that air, dust, moisture or foreign substances do not enter the refrigerant circuit. Contamination in the system may cause poor operating capacity, high pressure in the refrigeration cycle, explosion or injury.
- Ventilate the area immediately if there is refrigerant leakage during the installation. Leaked refrigerant gas is both toxic and flammable. Ensure there is no refrigerant leakage after completing the installation work.

Refrigerant Piping Connection Instructions

! CAUTION

- The branching pipe must be installed horizontally. An angle of more than 10° may cause malfunction.
- DO NOT install the connecting pipe until both indoor and outdoor units have been installed.
- Insulate both the gas and liquid piping to prevent water leakage.

Step1: Cut pipes

When preparing refrigerant pipes, take extra care to cut and flare them properly. This will ensure efficient operation and minimize the need for future maintenance.

1. Measure the distance between the indoor and outdoor units.
2. Using a pipe cutter, cut the pipe a little longer than the measured distance.

! CAUTION

DO NOT deform pipe while cutting. Be extra careful not to damage, dent, or deform the pipe while cutting. This will drastically reduce the heating efficiency of the unit.

1. Make sure that the pipe is cut at a perfect 90° angle. Refer to Fig. 7.1 for examples of bad cuts

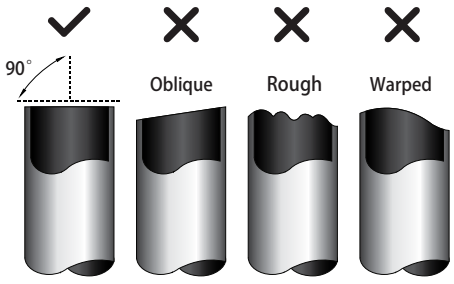


Fig. 7.1

Step 2: Remove burrs.

Burrs can affect the air-tight seal of a refrigerant piping connection. They must be completely removed.

1. Hold the pipe at a downward angle to prevent burrs from falling into the pipe.
2. Using a reamer or deburring tool, remove all burrs from the cut section of the pipe.

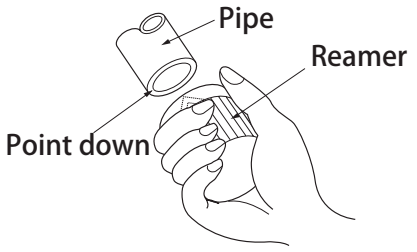


Fig. 7.2

Step 3: Flare pipe ends

Proper flaring is essential to achieve an airtight seal.

1. After removing burrs from cut pipe, seal the ends with PVC tape to prevent foreign materials from entering the pipe.
2. Sheath the pipe with insulating material.
3. Place flare nuts on both ends of pipe. Make sure they are facing in the right direction, because you can't put them on or change their direction after flaring. See Fig. 7.3

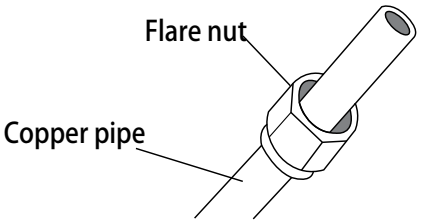


Fig. 7.3

4. Remove PVC tape from ends of pipe when ready to perform flaring work.
5. Clamp flare form on the end of the pipe. The end of the pipe must extend beyond the flare form.

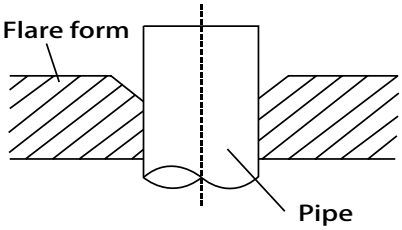


Fig. 7.4

6. Place flaring tool onto the form.
7. Turn the handle of the flaring tool clockwise until the pipe is fully flared. Flare the pipe in accordance with the dimensions shown in table 7.1.

Table 7.1: PIPING EXTENSION BEYOND FLARE FORM

Pipe gauge	Tightening torque	Flare dimension (A) (Unit: mm/Inch)		Flare shape
		Min.	Max.	
1/4"	18-20 N.m (183-204 kgf.cm)	8.4/0.33	8.7/0.34	
3/8"	25-26 N.m (255-265 kgf.cm)	13.2/0.52	13.5/0.53	
1/2"	35-36 N.m (357-367 kgf.cm)	16.2/0.64	16.5/0.65	
5/8"	45-47 N.m (459-480 kgf.cm)	19.2/0.76	19.7/0.78	

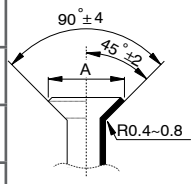


Fig. 7.5

8. Remove the flaring tool and flare form, then inspect the end of the pipe for cracks and even flaring.

Step 4: Connect pipes

Connect the copper pipes to the indoor unit first, then connect it to the outdoor unit. You should first connect the low-pressure pipe, then the high-pressure pipe.

1. When connecting the flare nuts, apply a thin coat of refrigeration oil to the flared ends of the pipes.
2. Align the center of the two pipes that you will connect.

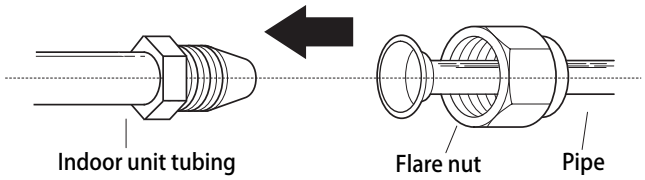


Fig. 7.6

3. Tighten the flare nut as tightly as possible by hand.
4. Using a spanner, grip the nut on the unit tubing.
5. While firmly gripping the nut, use a torque wrench to tighten the flare nut according to the torque values in table 7.1.

NOTE: Use both a spanner and a torque wrench when connecting or disconnecting pipes to/from the unit.

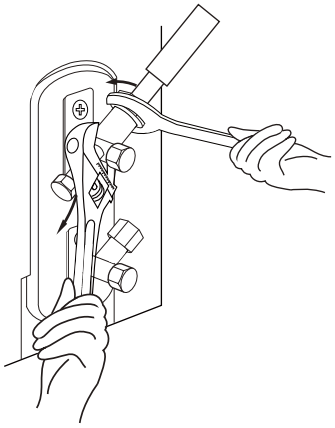


Fig. 7.7

CAUTION

- Be sure to wrap insulation around the piping. Direct contact with the bare piping may result in burns or frostbite.
- Make sure the pipe is properly connected. Over tightening may damage the bell mouth and under tightening may lead to leakage.

NOTE ON MINIMUM BEND RADIUS

Carefully bend the tubing in the middle according to the diagram below. DO NOT bend the tubing more than 90° or more than 3 times.

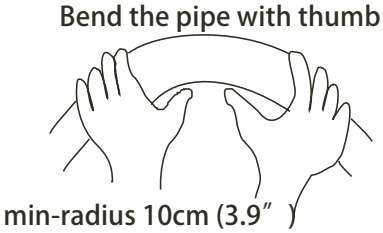


Fig. 7.8

6. After connecting the copper pipes to the indoor unit, wrap the power cable, signal cable and the piping together with binding tape.

NOTE: DO NOT intertwine signal cable with other wires. While bundling these items together, do not intertwine or cross the signal cable with any other wiring.

7. Thread this pipeline through the wall and connect it to the outdoor unit.
8. Insulate all the piping, including the valves of the outdoor unit.
9. Open the stop valves of the outdoor unit to start the flow of the refrigerant between the indoor and outdoor unit.

CAUTION

Check to make sure there is no refrigerant leak after completing the installation work. If there is a refrigerant leak, ventilate the area immediately and evacuate the system (refer to the Air Evacuation section of this manual).

Wiring

8

Safety Precautions

⚠ WARNING

- Be sure to disconnect the power supply before working on the unit.
- All electrical wiring must be done according to local and national regulations.
- Electrical wiring must be done by a qualified technician. Improper connections may cause electrical malfunction, injury and fire.
- An independent circuit and single outlet must be used for this unit. DO NOT plug another appliance or charger into the same circuit. If the electrical circuit capacity is not enough or there is a defect in the electrical work, it can lead to shock, fire, unit and property damage.
- Connect the power cable to the terminals and fasten it with a clamp. An insecure connection may cause fire.
- Make sure that all wiring is done correctly and the control board cover is properly installed. Failure to do so can cause overheating at the connection points, fire, and electrical shock.
- Ensure that main supply connection is made through a switch that disconnects all poles, with contact gap of a least 3mm (0.118″).
- DO NOT modify the length of the power cord or use an extension cord.

! CAUTION

- Connect the outdoor wires before connecting the indoor wires.
- Make sure you ground the unit. The grounding wire should be away from gas pipes, water pipes, lightning rods, telephone or other grounding wires. Improper grounding may cause electrical shock.
- DO NOT connect the unit with the power source until all wiring and piping is completed.
- Make sure that you do not cross your electrical wiring with your signal wiring, as this can cause distortion and interference.

Follow these instructions to prevent distortion when the compressor starts:

- The unit must be connected to the main outlet. Normally, the power supply must have a low output impedance of 32 ohms.
- No other equipment should be connected to the same power circuit.
- The unit's power information can be found on the rating sticker on the product.

TAKE NOTE OF FUSE SPECIFICATIONS

The air conditioner's circuit board(PCB) is designed with a fuse to provide overcurrent protection. The specifications of the fuse are printed on the circuit board, such as:
Outdoor unit: T20A/250VAC(for <24000Btu/h unit), T30A/250VAC(for >24000Btu/h unit)

NOTE: The fuse is made of ceramic.

Outdoor Unit Wiring

⚠ WARNING

Before performing any electrical or wiring work, turn off the main power to the system.

1. Prepare the cable for connection
   a. You must first choose the right cable size before preparing it for connection. Be sure to use H07RN-F cables.

Table 8.1: Minimum Cross-Sectional Area of Power Cables North America

Rated Current of Appliance (A)	AWG
≤7	18
7 - 13	16
13 - 18	14
18 - 25	12
25 - 30	10

b. Using wire strippers, strip the rubber jacket from both ends of signal cable to reveal about 15cm (5.9”) of the wires inside.

c. Strip the insulation from the ends of the wires.

d. Using a wire crimper, crimp u-lugs on the ends of the wires.

NOTE: While connecting the wires, please strictly follow the wiring diagram (found inside the electrical box cover).

2. Remove the electric cover of the outdoor unit. If there is no cover on the outdoor unit, disassemble the bolts from the maintenance board and remove the protection board. (See Fig. 8.1)

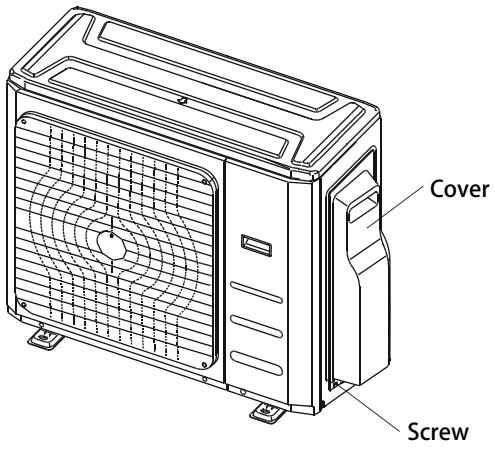


Fig. 8.1

3. Connect the u-lugs to the terminals
Match the wire colors/labels with the labels on the terminal block, and firmly screw the u-lug of each wire to its corresponding terminal.

4. Clamp down the cable with designated cable clamp.

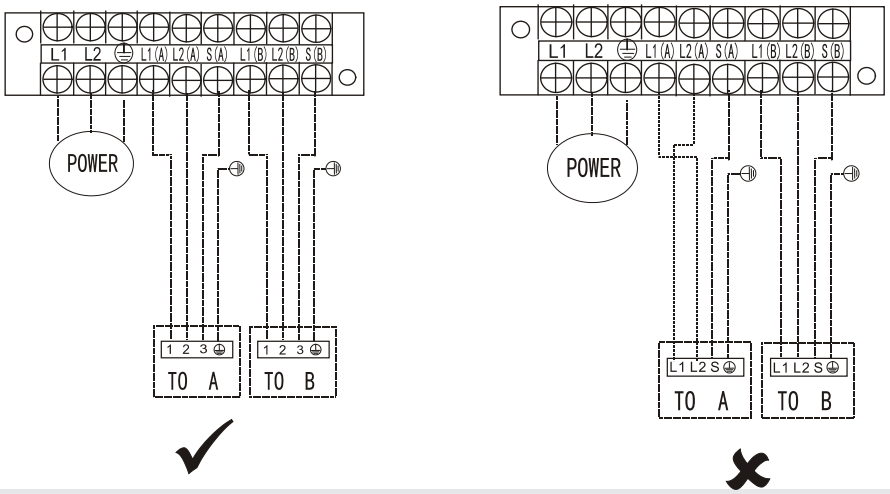
5. Insulate unused wires with electrical tape. Keep them away from any electrical or metal parts.

6. Reinstall the cover of the electric control box.

Wiring Figure

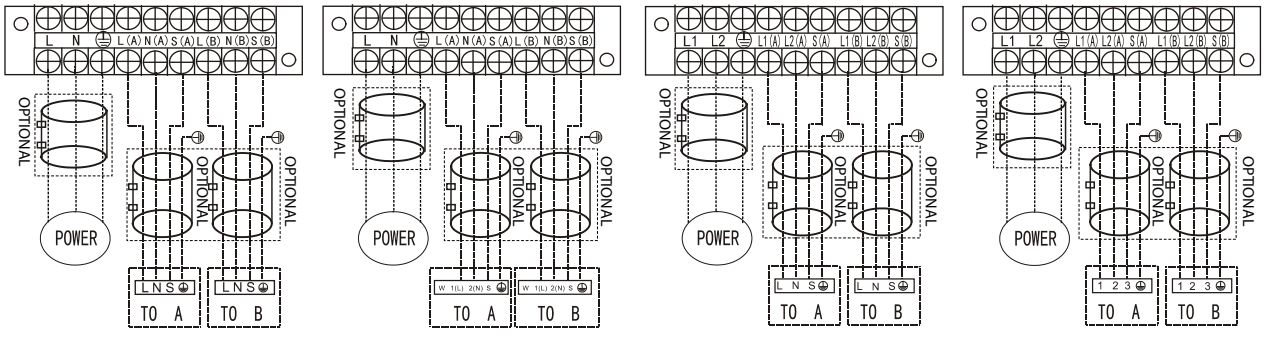
CAUTION

Connect the connective cables to the terminals, as identified, with their matching numbers on the terminal block of the indoor and outdoor units. For example, in the US models shown in the following diagram, Terminal L1(A) of the outdoor unit must connect with terminal L1 on the indoor unit.

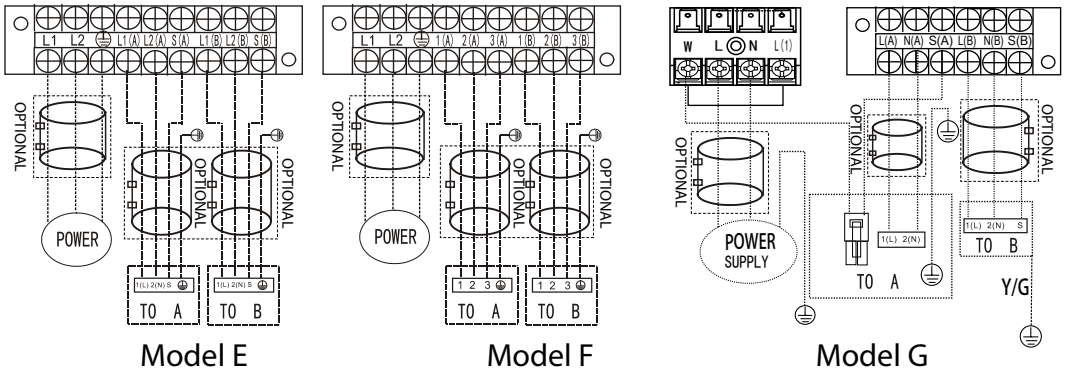


NOTE: Refer to the following figures if end-users wish to perform their own wiring.
Run the main power cord through the lower line-outlet of the cord clamp.

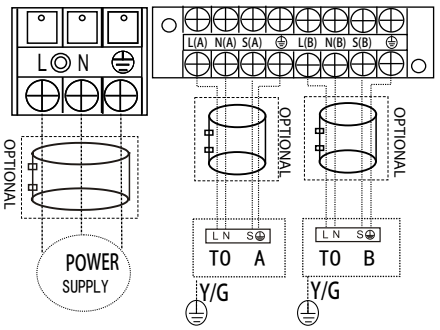
One-two models:



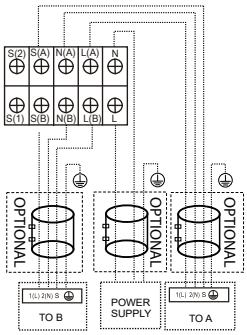
Model A Model B Model C Model D



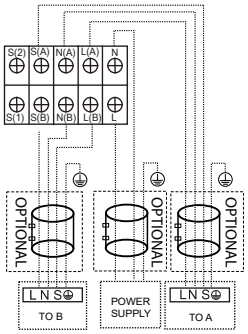
Model E Model F Model G



Model H



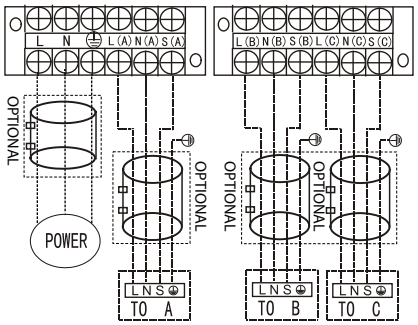
Model I



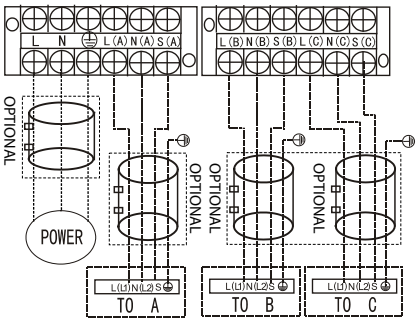
Model J

NOTE: Please refer to the following figures if end-users wish to perform their own wiring.

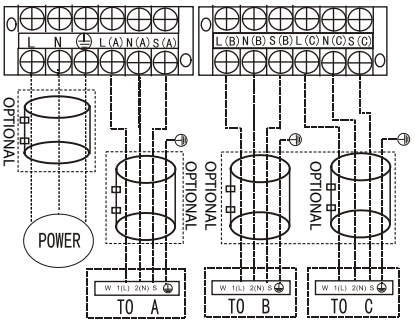
One-three models:



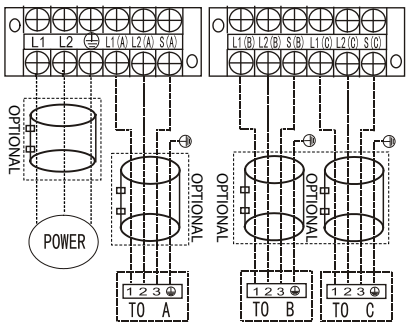
Model A



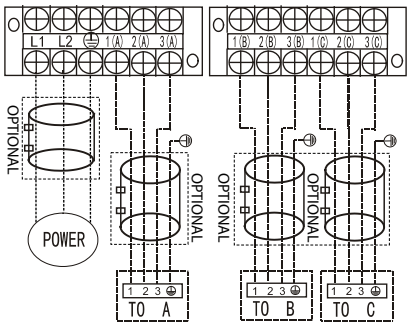
Model B



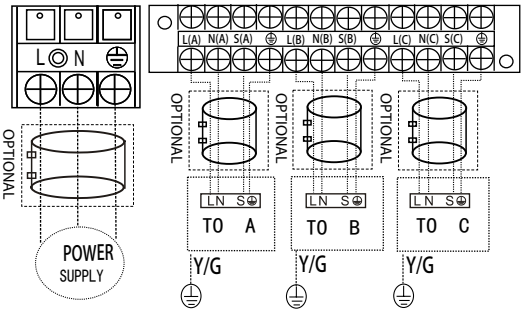
Model C



Model D

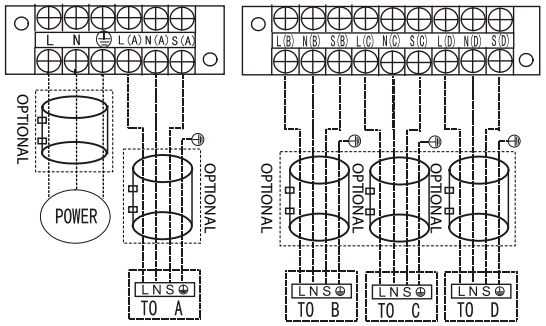


Model E

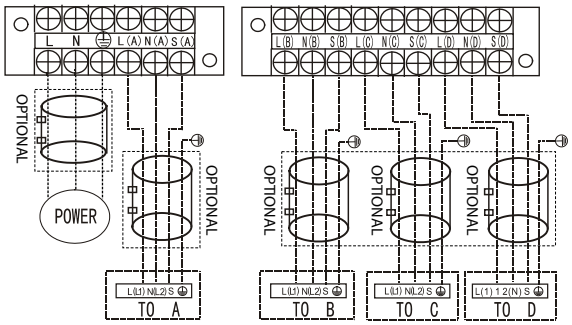


Model F

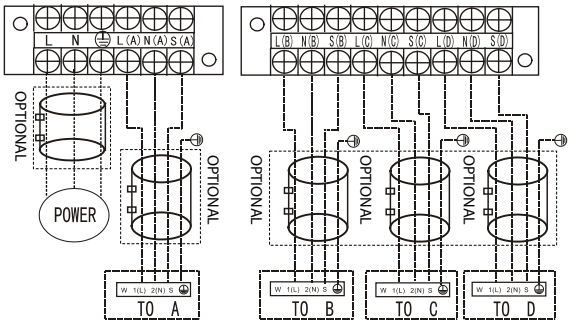
One-four models:



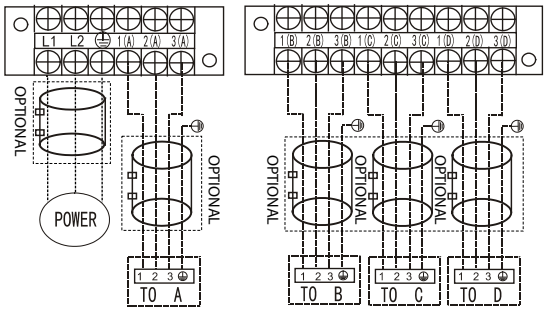
Model A



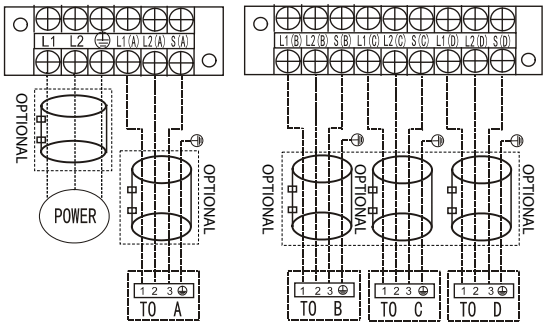
Model B



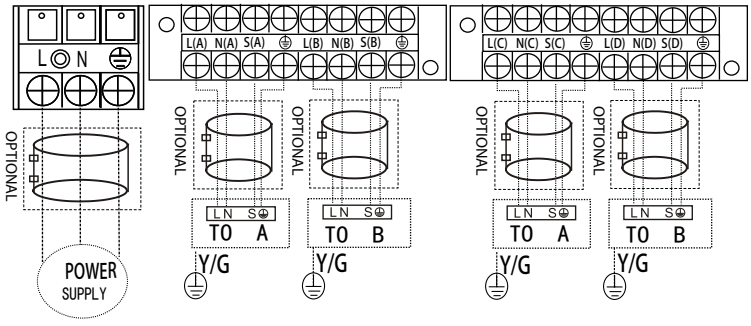
Model C



Model D



Model E



Model F

CAUTION

After confirmation of the above conditions, follow these guidelines when performing wiring:

- Always have an individual power circuit specifically for the air conditioner. Always follow the circuit diagram posted on the inside of the control cover.
- Screws fastening the wiring in the casing of electrical fittings may come loose during transportation. Because loose screws may cause wire burn-out, check that the screws are tightly fastened.
- Check the specifications for the power source.
- Confirm that electrical capacity is sufficient.
- Confirm that starting voltage is maintained at more than 90 percent of the rated voltage marked on the name plate.
- Confirm that the cable thickness is as specified.
- Always install an earth leakage circuit breaker in wet or moist areas.
- The following can be caused by a drop in voltage: vibration of a magnetic switch, damaging the contact point, broken fuses, and disturbance of normal functioning.
- Disconnection from a power supply must be incorporated into the fixed wiring. It must have an air gap contact separation of at least 3mm in each active (phase) conductors.
- Before accessing terminals, all supply circuits must be disconnected.

NOTE: To satisfy the EMC compulsory regulations, which is required by the international standard CISPR 14-1:2005/A2:2011 in specific countries or districts, please make sure you apply the correct magnetic rings on your equipment according to the wiring diagram for your equipment .

Air Evacuation

9

Safety Precautions

CAUTION

- The outdoor unit does not need vacuuming. DO NOT open the outdoor unit's gas and liquid stop valves.
- DO NOT use refrigerant to purge the system.

Evacuation Instructions

Before using a manifold gauge and a vacuum pump, read their operation manuals to make sure you know how to use them properly.

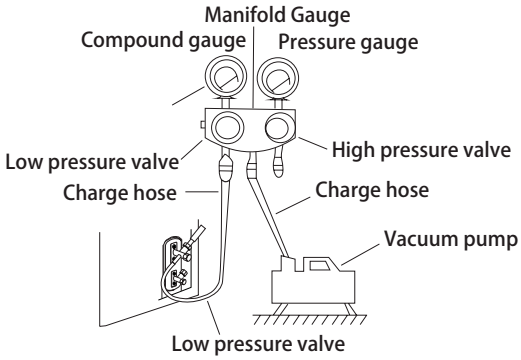


Fig. 9.1

1. Connect the manifold gauge's charge hose to the service port on the outdoor unit's low pressure valve.
2. Connect the manifold gauge's charge hose from the to the vacuum pump.
3. Open the Low Pressure side of the manifold gauge. Keep the High Pressure side closed.
4. Turn on the vacuum pump to evacuate the system.
5. Run the vacuum for at least 15 minutes, or until the micron gauge reads <400 microns.
6. Close the manifold gauge's Low Pressure valve and turn off the vacuum pump.
7. Wait for 5 minutes, then confirm that system pressure remains below 500 microns.

NOTE: If there is no change in system pressure, unscrew the cap from the packed valve (high pressure valve). If there is a change in system pressure, there may be a gas leak.

8. Insert hexagonal wrench into the packed valve (high pressure valve) and open the valve by turning the wrench 1/4 counterclockwise. Listen for gas to exit the system, then close the valve after 5 seconds.

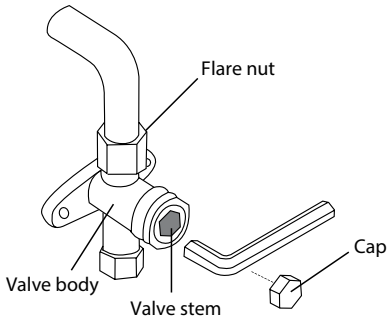


Fig. 9.2

9. Watch the Pressure Gauge for one minute to make sure that there is no change in pressure. It should read slightly higher than the atmospheric pressure.
10. Remove the charge hose from the service port.
11. Using hexagonal wrench, fully open both the high pressure and low pressure valves.

OPEN VALVE STEM S GENTLY

When opening valve stems, turn the hexagonal wrench until it hits against the stopper. DO NOT try to force the valve to open further.

12. Tighten valve caps by hand, then seat caps with a wrench.
13. On units with main and zone refrigerant service valves, do not open main valves until evacuation and leak detection is complete.

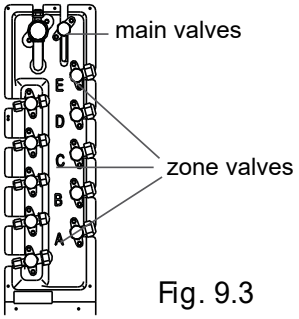


Fig. 9.3

Note On Adding Refrigerant

CAUTION

- Refrigerant charging must be performed after wiring, vacuuming, and the leak testing.
- DO NOT exceed the maximum allowable quantity of refrigerant or overcharge the system. Doing so can damage the unit or impact it's functioning.
- Charging with unsuitable substances may cause explosions or accidents. Ensure that the appropriate refrigerant is used.
- Refrigerant containers must be opened slowly. Always use protective gear when charging the system.
- DO NOT mix refrigerants types.

N=2(one-twin models), N=3(one-three models), N=4(one-four models). Depending on the length of connective piping or the pressure of the evacuated system, you made need to add refrigerant. Refer to table below for refrigerant amounts to be added:

ADDITIONAL REFRIGERANT PER PIPE LENGTH

Connective Pipe Length(m)	Air Purging Method	Additional Refrigerant	
Pre-charge pipe length (ft/m) (Standard pipe length xN)	Vacuum Pump	N/A	
More than (Standard pipe lengthxN) ft/m	Vacuum Pump	Liquid Side: Ø 6.35 (Ø 1/4") R410A (Total pipe length - standard pipe lengthxN) x15g/m (Total pipe length - standard pipe lengthxN) x0.16oZ/ft	Liquid Side: Ø 9.52 (Ø 3/8") R410A (Total pipe length - standard pipe lengthxN) x30g/m (Total pipe length - standard pipe lengthxN) x0.32oZ/ft

Note: The standard pipe length is 7.5m (24.6').

Safety And Leakage Check

Electrical safety check

Perform the electrical safety check after completing installation. Cover the following areas:

1. Insulated resistance
   The insulated resistance must be more t han 2MΩ.
2. Grounding work
   After finishing grounding work, measure t he grounding resistance by visual detection and using the grounding resistance tester. Make sure the grounding resistance is less than 4Ω.
3. Electrical leakage check (performing during test while unit is on)
   During a test operation after completed installation, use a multimeter to perform an electrical leakage check. Turn off the unit immediately if leakage happens. Try and evaluate different solutions until the unit operates properly.

Gas leak check

1. Soap water method:
   Apply a soap-water solution or a liquid neutral detergent on the indoor unit connection or outdoor unit connections with a soft brush to check for leakage of the connecting points of the piping. If bubbles emerge, the pipes are experiencing leakage.
2. Leak detector
   Use the leak detector to check for leakage.

NOTE: The illustration is for example purposes only. The actual order of A, B, C and D on the machine may be slightly different from the unit you purchased but the general shape will remain the same.

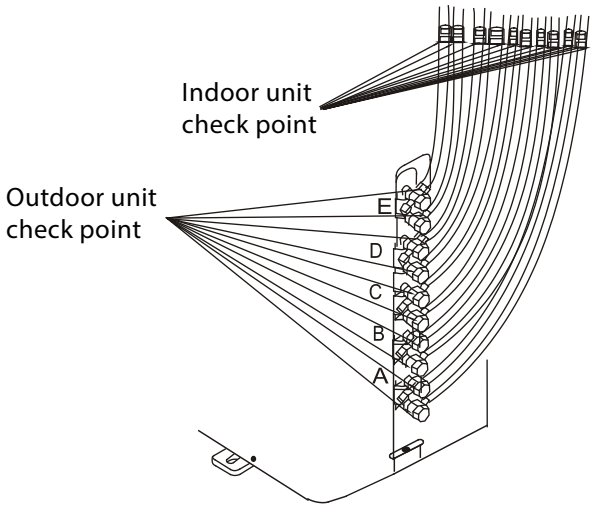


Fig. 9.4

A, B, C, D are points for one-four type.

Test Run

10

Before Test Run

A test run must be performed after the entire system has been completely installed. Confirm the following points before performing the test:

a) The indoor and outdoor units are properly installed.
b) Piping and wiring are properly connected.
c) No obstacles near the inlet and outlet of the unit that might cause poor performance or product malfunction.
d) The refrigeration system does not leak.
e) Drainage system is unimpeded and draining to a safe location.
f) The heating insulation is properly installed.
g) The grounding wires are properly connected.
h) Length of the piping and additional refrigerant stow capacity have been recorded.
i) The power voltage is the correct voltage for the air conditioner.

CAUTION

Failure to perform the test run may result in unit damage, property damage or personal injury.

Test Run Instructions

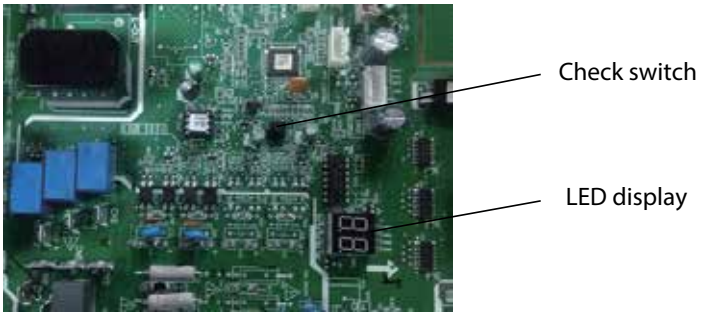
1. Open both the liquid and gas stop valves.
2. Turn on the main power switch and allow the unit to warm up.
3. Set the air conditioner to COOL mode.
4. For the Indoor Unit
   a. Ensure the remote control and its buttons work properly.
   b. Ensure the louvers move properly and can be changed using the remote control.
   c. Double check to see if the room temperature is being registered correctly.
   d. Ensure the indicators on the remote control and the display panel on the indoor unit work properly.
   e. Ensure the manual buttons on the indoor unit work properly.
   f. Check to see that the drainage system is unimpeded and draining smoothly.
   g. Ensure there is no vibration or abnormal noise during operation.
5. For the Outdoor Unit
   a. Check to see if the refrigeration system is leaking.
   b. Make sure there is no vibration or abnormal noise during operation.
   c. Ensure the wind, noise, and water generated by the unit do not disturb your neighbors or pose a safety hazard.

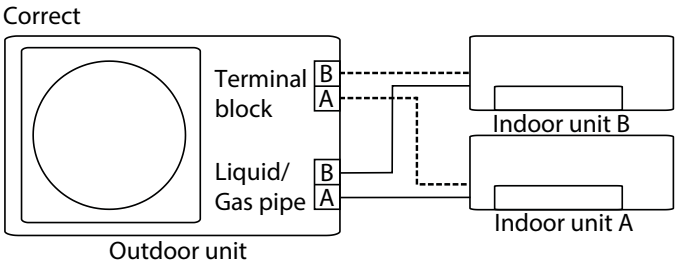
NOTE: If the unit malfunctions or does not operate according to your expectations, please refer to the Troubleshooting section of the Owner's Manual before calling customer service.

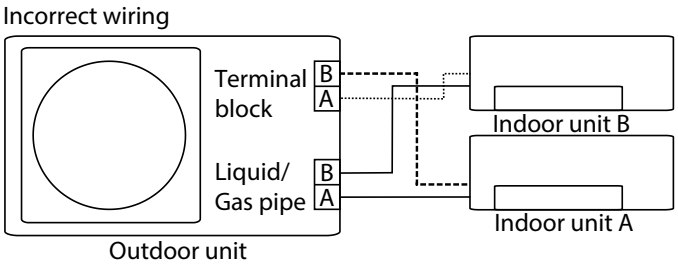
Function of Automatic Wiring/Piping Correction 11

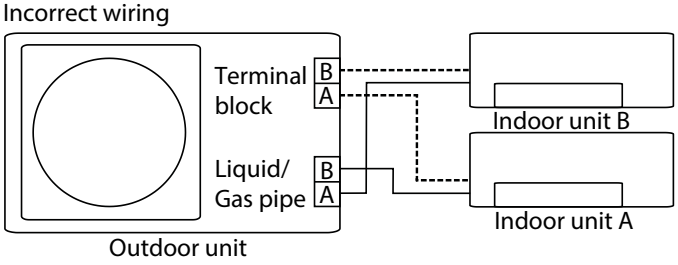
Automatic Wiring/Piping Correction Function

More recent models now feature automatic correction of wiring/piping errors. Press the "check switch" on the outdoor unit PCB board for 5 seconds until the LED displays "CE", indicating that this function is working, Approximately 5-10 minutes after the switch is pressed, the "CE" disappears, meaning that the wiring/piping error is corrected and all wiring/piping is properly connected.









How To Activate This Function

1. Check that outside temperature is above 41 F.(This function does not work when outside temperature is not above 41 F.)
2. Check that the stop valves of the liquid pipe and gas pipe are open.
3. Turn on the breaker and wait at least 2 minutes.
4. Press the check switch on the outdoor PCB board unit LED display "CE".

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Due to ongoing product improvements, specifications and dimensions are subject to change and correction without notice or incurring obligations. Determining the application and suitability for use of any product is the responsibility of the installer. Additionally, the installer is responsible for verifying dimensional data on the actual product prior to beginning any installation preparations.

Incentive and rebate programs have precise requirements as to product performance and certification. All products meet applicable regulations in effect on date of manufacture; however, certifications are not necessarily granted for the life of a product. Therefore, it is the responsibility of the applicant to determine whether a specific model qualifies for these incentive/rebate programs.